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NRO REVIEW COMPLETED

15 AUG 1966

MEMORANDUM FOR : Director of Reconnaissance, CIA  
SUBJECT : ISINGLASS

1. This memorandum is for your information only. Its purpose is to brief you on ISINGLASS prior to the EXCOM meeting now scheduled for 17 August. On the agenda at that meeting is the question of whether or not to proceed with a nine month Phase I research and development program for ISINGLASS [REDACTED]

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2. Introduction

The ISINGLASS system has been under active investigation in OSA/DD/S&T for the past two years as a possible follow-on to the OXCART. While no Government funds have been made available, McDonnell Aircraft Corporation has spent [REDACTED] of corporate money for feasibility studies. These studies have served to outline much of the development necessary and have considerably increased our confidence in the system concept and in the contractor's ability to develop and produce the vehicle.

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3. System Capabilities

The ISINGLASS system is an advanced boost-glide vehicle. It is launched at about 25,000 feet, from a B-52 or equivalent aircraft, boosted by a Pratt and Whitney high pressure liquid hydrogen-liquid oxygen rocket engine to an altitude [REDACTED]. Following engine cut-off, the vehicle glides for about [REDACTED] to landing. The portion of the glide path [REDACTED] is useful for missions [REDACTED]. Total range from launch to landing is [REDACTED]. Diagrams of the vehicle and mission profiles are appended in Attachment I. Studies conducted in OSI/DD/S&T show that ISINGLASS vulnerability to current and projected Soviet defenses is low, significantly

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lower than that of satellite reconnaissance systems (Attachment II). The system would be capable of wide swath, technical intelligence quality photography, rapid reaction time, and high probability of mission success. Furthermore, the aerodynamic character of the vehicle permits considerable flexibility in planning of ground tracks.

#### 4. Role in NRP

The ISINGLASS system is designed as a follow-on to the OXCART vehicle and as a back-up to currently projected photographic satellites, to be used if satellite vulnerability reduces their usefulness or if the access time to specific targets is critical. To our knowledge, a satisfactory back-up capability does not now exist in the National Reconnaissance Program, although a well balanced Program should continue development in sophisticated aircraft fields as well as on satellites in view of the unique advantages to the use of both types of systems. We have, therefore, recommended to the NRO that the necessary feasibility and system design studies be accomplished to solidify the McDonnell technology. These studies will allow a total program decision to be made as necessary at a later date. This McDonnell effort would be concurrent with engine component development now underway at Pratt and Whitney [redacted] under modest USAF and NASA support.

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#### 5. Budgetary Actions

On 16 November 1965, EXCOM agreed that funds for ISINGLASS research and development could come from the NRO general R&D account. At the same time, NRO was asked to conduct a staff study on the role of the ISINGLASS concept in the NRP, and Mr. Vance and Dr. Hornig requested a full briefing of EXCOM. Both men had previously received short briefings on the concept. In February 1966, [redacted] research and development program on the vehicle airframe was submitted to Dr. Flax at his suggestion. This program (Attachment III) is for nine months and is designed to determine the capability of the ISINGLASS system to satisfy our goals for resolution, swath width, survivability, reaction time, range and tactical flexibility. In addition, the study is intended to establish reliable overall system cost estimates (currently projected at [redacted] including engine costs). This research and development program is the effort we consider to be necessary at

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this time. Subsequently, a second phase program was submitted (Attachment IV) which was to cost [redacted] and also last nine months. To date, we have had no response from NRO on the staff study or the suggested research and development programs.

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Because of the passage of time, we are now requesting the [redacted] Phase I study be funded in FY'67, and the [redacted] Phase II study in FY'68. This would permit a program decision in late FY'68 based on thorough evaluation of the results of the Phase I and II study programs. If a total program is approved, including RDT&E, production and operations, the subsequent funding requirements would be as follows:

FY'69  
FY'70  
FY'71  
FY'72



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#### 6. Summary

In summary, we have asked NRO to fund the necessary feasibility and design studies to solidify McDonnell technology and to provide, within the NRP, a needed option to satellite systems. These studies will cost [redacted] in FY'67 and [redacted] in FY'68 and permit a total program decision to be made in late FY'68.

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PAUL N. BACALIS  
Colonel USAF

Director of Special Activities

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Acting Deputy Director for  
Science and Technology



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APD/R&D/OSA [redacted] (15 August 1966)

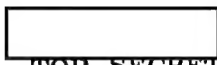
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- 7 - D/R&D/OSA wo/att
- 8 - APD/R&D/OSA wo/att
- 9 - chrono wo/att
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Atts: 4

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